WINCRUZ

Windows Real Time Sighting-Effort Event Logger

Contents

Introduction

WinCruz is an event-driven program to record sighting and effort data on ship line-transect surveys and to graphically display sighting locations. It is written in Visual Basic 5.0 and is available in a 32-bit version for Windows 95/NT.

The program consists of two main windows: Data Form Window and Graphic Display Window. All data input/output are presented on the Data Form Window in a character based format. Function keys select the various input forms, and function key events can be queued for time stamping. Two queues are maintained containing past and present events, and past events can be edited to correct previous input form data.

The Graphic Display Window displays the ship in the center, and the sightings appear as dots around the ship. As the ship moves, the dots move in relation to the ship's movement. The right side of the screen shows the list of sightings and clicking on any sighting highlights the corresponding dot. Clicking on the dot brings up the resighting form on the Data Form Window. The scale of the display can range from 1 to 20, representing a 4x4 nautical mile grid to an 80x80 nautical mile grid.

WinCruz writes data in the DAS format (see Appendix). The output files are labeled DASxxxx.yzz and BAKxxxx.yzz, where xxxx is the time the program starts, y is the month in hex format, and zz is the day. The BAK file is the backup information of the events as they happen, including any edits of previous forms. The DAS file contains all the corrected information. WinCruz has a limit of 500 events per session in the past event queue to keep memory usage to a minimum, but can be increased through a recompilation of the program.

Data input from ship systems are received through the computer's communications port (or can be entered manually), and can accept latitude, longitude, speed, course, wind speed, wind direction, and surface water temperature. Data can be in either a Global Positioning System (GPS) NMEA standard, or column output from a ship computer (SCS) gathering all ship information. The NMEA standard uses a "$" followed by a five character descriptor to define each line of output. The column output has all data on each line, usually using a space or comma to separate each column. Such an output can be provided by an SCS system.

Data Form

The current event buffer and past event buffer can show the following characters:

B - Begin effort marker. See F3. Shows up only when F3 is pressed for the first time.
R - Resume effort marker. See F3.
E - End effort. See F5.
P - Observer positions. See F6.
Q - Tracking crew positions. See F6.

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V  -  Viewing conditions. See F7.
N  -  Navigation information. See F8.
W  -  Weather information. See F9.
M  -  Match in sighting.
m  -  Possible match in sighting.
X  -  Incomplete record; needs more information.
C  -  Comment string. See F10.
S  -  Cetacean sighting. See F2.
s  -  Resighting information. See Shift F2.
A  -  Auxiliary sighting information. See F2.
t  -  Turtle sighting. See F4.
F  -  Boat sighting. See Shift F4.
*  -  10 minute marker.
#  -  Deleted entry. See F1.
```

Function keys available

F1 - Undo - Deletes the current event in the buffer queue, or deletes the event displayed in the past event queue. Displays a "#" in the past event queue for the item deleted. When a sighting is deleted, all subsequent sightings will be renumbered.

F2 - Sighting - Adds "SA" to the event queue for sighting and auxiliary sighting information. The sight number in sighting window can be changed to reflect a new sighting number. If a positive number is used for "Observer Count" in the Setup/Initialization pull-down menu, a "1" can be added to the "SA" events for observer school size estimates. To not use school size estimates, make the "Observer Count" zero (0).

Shift F2 - Re-sighting - Adds current location information for a previous sighting and "s" to the event queue. The sight number must be for a current (F2) sighting in the past event queue. If "Behavior Codes" is checked in the Setup/Initialization pull-down menu, then an "H" will be added to the event queue for behavior information.

Ctrl F2 – Object sighting – An object is usually anything other than mammal. A small red dot is placed on the graphic display window. No information is written to the data file.

F3 - Begin/Resume Effort - If pressed for the first time after the program begins, "BRPVNW" is added to the event queue. After that, when pressed and the effort window displays "OFF", then "RPVNW" is added to the event queue. "B" is for begin effort/day, "R" is for resume effort, "P" is for observer positions (see F6), "V" is for viewing conditions (see F7), "N" is for navigation information, "W" is for weather information. This button must be pressed before any on-effort work is to begin. F3 will be ignored if already "ON" effort.

F4 - Turtle Sighting - Adds "t" to the event queue for turtle sighting information.

Shift F4 – Boat – Adds "F" to the event queue for a boat sighting.

F5 - End Effort - Adds "E" to the event queue. No window information is displayed. The effort window will show "OFF" effort. F5 will be ignored if already "OFF" effort.

Shift F5 - New Last Sight Number - Does nothing to the event queue. Only changes the last sight number. When a new sighting is seen, the last sight number is incremented by 1.

F6 - Observer Positions - Adds "PQVNW" to the event queue. There are the two left, and two right observer position code boxes. The tracking team has left, right and recorder positions. After an observer position change, new viewing conditions, navigation information, and weather information must be updated.

F7 - Viewing Conditions - Adds "V" to the event queue. Allows viewing condition information to be changed.

F8 - Navigation Information - Adds "N" to the event queue. This information is obtained from the GPS, but can be changed from this window.

F9 - Weather Information - Adds "W" to the event queue. All weather information is updated through this window.

F10 - Comment - Any comments and deleted information or missing information can be recorded in this window.

F12 - Window View - Changes from the Data Form view to the Graphic Display view, and back.

**Additional keys available**

Page Up/Page

3

Down (PgUp/PgDn) - You can use page up and page down to peruse the past event queue. Page up moves the event <> markers to the left, and page down moves them to the right. Moving past the last event on the right ends the past event queue viewing. If you press F1 during a past event inspection, that event will be deleted. Pressing "Enter" or "Esc" on a displayed window with an "Accept" button will replace that past event with the new information. This should only be used if you are correcting information recently entered. If, rather, the previous information was correct and new information needs to be entered, then use the appropriate function key.

Escape (Esc) - When pressed, the data in the information blocks will be written to disk, and the event queues updated.

Data Form Display

Shows the function key assignments, plus the current information display. This display shows the date and time, with the last sighting number and the ON/OFF effort display. Also displayed is the GPS data, the observer position information, the viewing conditions, and the weather conditions from the last time entered.

Graphic Display
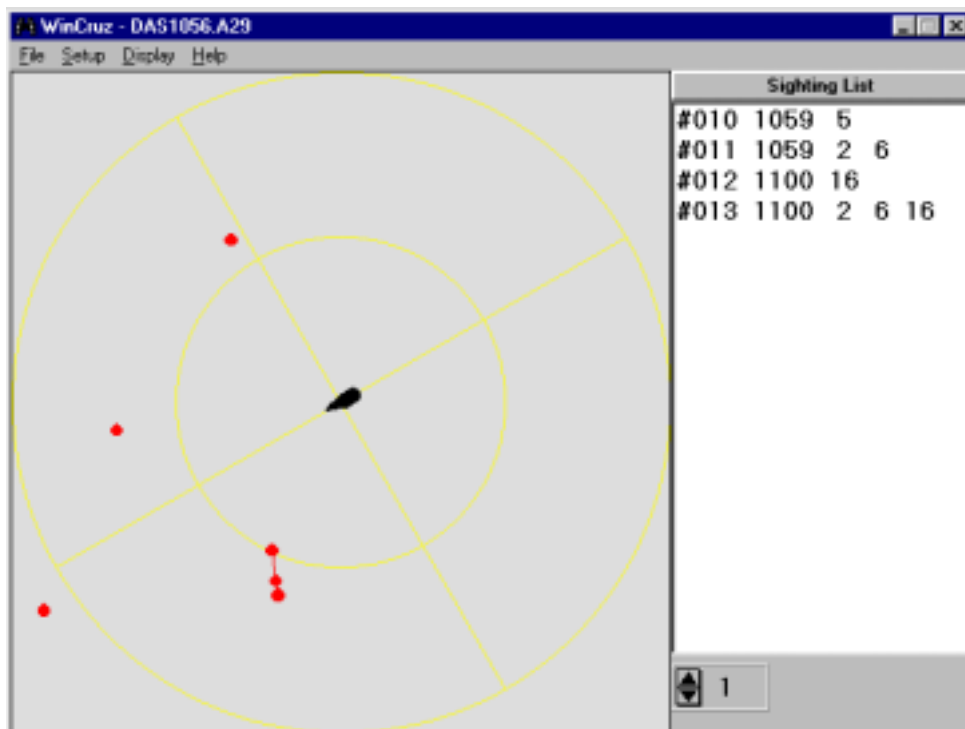
Shows the current ship position and orientation. The ship always remains in the center of the screen. All sightings will be shown in relation to the ship as small filled dots. Small non-filled dots connected to the filled dots are previous sighting locations for that sighting.

Next to the display is the Sighting Information list, which lists all sightings with sight number, time sighted and the species codes entered in the auxiliary information window for that sighting. Clicking on any sighting will make the related dot for that sighting look like a dot within a dot to make finding a previous sighting easier.

Below the Sighting Information list and next to the display window are the change display scale arrows. The display scale starts at 1, which is 1 nautical mile per grid area, and the display window is a 4x4 grid. A scale 2 setting is an 8x8 grid, or 2 nautical miles per grid area. The scale change goes up to 20, which shows an 80x80 grid.

Using the left mouse button on the display screen shows the latitude and longitude at the tip of the mouse cursor. Left clicking a filled sighting dot shows the latitude and longitude, sight number, angle in relation to the ship, and distance from the ship in nautical miles of that sighting. Right clicking a filled sighting dot will bring up the Data Form and do a Re-Sight (Shift F2) for that sighting. The only difference is that the program knows the sight number of the dot you clicked on and fills that piece of information in the sight number block for the re-sight window.

The binocular reticle values are converted into nautical miles using the following

$$ReticleDistance = ShipHeight * \frac{\sqrt{1 - Cos(Zx0.0174532\ )^2}}{Cos(Zx0.0174532)}$$

equation:

$$Z = \frac{arctan(\frac{89.173}{\sqrt{ShipHeight}})}{0.0174532} - ReticleAnglexReticle$$

where
For the R/V David Starr Jordan, ShipHeight=0.003942 nmi and ReticleAngle=0.0623 degrees (Barlow and Lee, 1994).

Keys available

Page Up/Page Down (PgUp/PgDn) - Changes the display scale. PgUp increases the scale factor, PgDn decreases the scale factor.

Ctrl G - Toggles on/off the display circular grid lines. The cross-hairs correspond to ship's heading.

Ctrl L - Toggles on/off heading lines for cetacean sighting dots. These lines parallel the ship's heading.

Ctrl S - Toggles on/off sighting rings around each sighting. As time passes, the rings grow outward from each sighting designating a possible area each animal may cover. The speed

variable can be changed in the Startup Variables window.

Ctrl C - Toggles on/off confidence diamonds that extend out from each sighting from entered possible sighting direction and speed relative to the bow of the ship. The diamond shapes can be altered by the Minimum Speed Multiplier, Maximum Speed Multiplier, and Minor Axis Multiplier in the Startup Variables window.

Ctrl R - Toggles on/off relative course display. In relative course mode (default), the ship always points upward, regardless of magnetic heading. In absolute course mode (toggled off), the ship points in the direction of magnetic heading, and the top of the screen is North.

Ctrl X - Ends program.

Startup Variables

In the 32-bit version of WinCruz, under the Setup pull-down menu, is the Initialization screen. This screen contains the following variables and defaults:

Screen	Default
WinCruz Directory:	C:\WinCruz
Data Directory:	C:\DAS
Backup Directory:	C:\BAK
Communications:	COM1:4800,N,8,1
GPS Location:	$GPGLL,7,2,9,5,15,1,17,3,20,5,26,1,75
GPS Speed:	$GPRMC,51,5,37,5
Sample Interval:	120
Ship Height:	10.74 (in meters)
Reticle Angle:	0.00134565 (in radians)
Observer Team:	\<not checked\>
Mammal Speed:	5
Min Speed Mult.:	0.5
Max Speed Mult.:	2.0
Minor Axis Mult.:	0.5
Observer Count:	0
NMEA Input:	\<not checked\>
Time Sync:	\<not checked\>
Tracking Team:	\<not checked\>
Behavior Codes:	\<not checked\>
Latitude Column:	2
N/S Column:	3

Longitude Column: 4
E/W Column: 5
Speed Column: 11
Heading Column: 8
Date Column: 10
Time Column: 2

WinCruz Directory/Directory - Drive and directory where WinCruz.exe is located.

Data Directory/DATADIR - Drive and directory where the main data files are to be placed.

Backup Directory/BACKUPDIR - Drive and directory where the backup files are to be placed.

Communications/COMM - Input COMM port followed by the port settings

     COM1:4800,N,8,1

     COM1:   - COMM port number. Can be ports 1 through 4
     4800   - Baud rate. Most GPS use 4800
     N   - No parity bit (E is even parity, O is odd parity)
     8   - 8 data bits (7 is even or odd parity is used)
     1   - 1 stop bit (can be 1, 1.5, or 2)

GPS Location/SATNAV - Format information for incoming GPS data.

        $GPGLL,7,2,9,5,15,1,17,3,20,5,26,1,75
               a b c d e f g hI j k l m

Example: $GPGLL,3215.45,N,11002.23,W

$GPGLL   - Start string to search for. Must be distinct and repeating.
a   - Number of characters after start string to 1st character of latitude degrees. In the above example, the letter G after the $ would be the 1st character. Therefore, the following 3 would be the 7th character after the start string.
b   - Number of characters representing latitude degrees.
c   - Number of characters after start string to 1st character of latitude minutes. In the above example, the character 1 (as in 15.45) would be the 9th character after the start string (in this case, following the $ character).
d   - Number of characters representing latitude minutes.
e   - Number of characters after start string to 1st character of latitude north/south indicator.
f   - Number of characters representing latitude N/S indicator.
g   - Number of characters after start string to 1st character of longitude degrees.

h - Number of characters representing longitude degrees.

I - Number of characters after start string to 1st character of longitude minutes.

j - Number of characters representing longitude minutes.

k - Number of characters after start string to 1st character of longitude east/west indicator.

l - Number of characters representing longitude E/W indicator.

m - Minimum number of characters that must be received before program will process   data.

GPS Speed/SPEED - Format information for incoming ship data.

$GPRMC,51,5,37,5
        a b c d

$GPRMC - Start string to look for. Must be distinct and repeating.

a - Number of characters after start string to 1st character of ship speed.

b - Number of characters representing ship speed.

c - Number of characters after start string to 1st character of ship heading.

d - Number of characters representing ship heading.

Sample Interval/SAMPLE - Number of seconds before a time marker is written to the output data files.

Ship Height/SHIPHEIGHT - Ship height coefficient for calculation of objects through binoculars.

Reticle Angle/RETICLEANGLE - Binocular reticle coefficient.

Observer Team - A boolean variable for two observer teams: one observer team and one tracking team. Default is Tracking Team Only.

NMEA Input - A boolean variable to set the program for NMEA input as used in the SATNAV variable, or through the format used by the SCS computer system as used on the R/V David Starr Jordan.

0 = Don't use NMEA format (SATNAV and SPEED must be set)

1 = Use NMEA format

If the value is 1 (checked), then the column numbers correspond to the comma delimited data from the GPS. GPS Location string and GPS Speed string only need the first 6 letters designating the needed type. For GPS Locations string, the 6 letters are almost always **$GPGLL**. For GPS Speed string, the first 6 letters might be **$GPRMC**. That way when you check the *NMEA Input* box, you don't need to make any changes to the location and speed strings making a change back to the other input parsing method easier.

Time Sync – A Boolean variable to set the program for using GPS time stamp to sync the computer's local time. This can only be checked if NMEA Input is checked. Uses the GPS Speed string to gather this information (usually $GPRMC). The computer clock will have its minutes and seconds set to the GPS GMT minutes and seconds, and an hour offset will be calculated from the computer hour and GPS GMT hour.

Installation

The installation of WinCruz uses a basic Microsoft installer that places the necessary programs and libraries in the proper directories. Run SETUP.EXE from the first floppy diskette, click on the install button, and insert the second diskette when prompted. In the 32-bit installation, the installer places a reference in the Add/Remove Programs Control Panel applet that will do the uninstall for you.

The following files are copied into the corresponding directories for the 32-bit version:

WinCruz.exe	C:\WINCRUZ
Threed32.ocx	C:\WINDOWS\SYSTEM
Tabctl32.ocx	C:\WINDOWS\SYSTEM
Msmask32.ocx	C:\WINDOWS\SYSTEM
Mscomm32.ocx	C:\WINDOWS\SYSTEM
Comdlg32.ocx	C:\WINDOWS\SYSTEM
Spin32.ocx	C:\WINDOWS\SYSTEM
VB40032.dll	C:\WINDOWS\SYSTEM
Ven2232.olb	C:\WINDOWS\SYSTEM
Olepro32.dll	C:\WINDOWS\SYSTEM
Msvcrt20.dll	C:\WINDOWS\SYSTEM
Msvcrt40.dll	C:\WINDOWS\SYSTEM
Ctl3d32.dll	C:\WINDOWS\SYSTEM
Mfc40.dll	C:\WINDOWS\SYSTEM

The following files are copied into the corresponding directories for the 16-bit version:

WinCruz.exe	C:\WINCRUZ
Threed16.ocx	C:\WINDOWS\SYSTEM
Tabctl16.ocx	C:\WINDOWS\SYSTEM
Msmask16.ocx	C:\WINDOWS\SYSTEM
Mscomm16.ocx	C:\WINDOWS\SYSTEM
Comdlg16.ocx	C:\WINDOWS\SYSTEM
Spin16.ocx	C:\WINDOWS\SYSTEM
VB40016.dll	C:\WINDOWS\SYSTEM
Vaen21.olb	C:\WINDOWS\SYSTEM

ctl3dv2.dll	C:\WINDOWS\SYSTEM
Oc25.dll	C:\WINDOWS\SYSTEM
Ole2.dll	C:\WINDOWS\SYSTEM
Typelib.dll	C:\WINDOWS\SYSTEM
Ole2disp.dll	C:\WINDOWS\SYSTEM
Ole2prox.dll	C:\WINDOWS\SYSTEM
Ole2conv.dll	C:\WINDOWS\SYSTEM
Storage.dll	C:\WINDOWS\SYSTEM
Compobj.dll	C:\WINDOWS\SYSTEM
Ole2.reg	C:\WINDOWS\SYSTEM
Ole2nls.dll	C:\WINDOWS\SYSTEM
Stdole.tlb	C:\WINDOWS\SYSTEM
Scp.dll	C:\WINDOWS\SYSTEM

For an upgrade of an interim version of WinCruz, copy the WinCruz.exe file from the diskette into the C:\Program Files\WINCRUZ directory. This will overwrite the WinCruz.exe file the currently exists. If you wish to save the previous version, copy the WinCruz.exe file in the C:\Program Files\WINCRUZ directory into another temporary directory, or rename it as WinCruz.old, before copying the diskette version onto the computer.

References

Barlow, J. and T. Lee. 1994. The estimation of perpendicular sighting distance on SWFSC research vessel surveys for cetaceans: 1974 to 1991. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-207. 46pp.

Appendix - DESCRIPTION OF DATA OUTPUT FORMAT FOR FILES DAS* AND BAK*

<u>COLUMNS</u>

```
1-3        3-digit sequence number for the given event.  Sequence
           starts anew each day.
4          1-digit code to indicate the type of event.
                   S     marine mammal sighting
                   M     match of previous marine mammal sighting
                   m     possible match of previous sighting
                   B     cruise number
                   t     turtle sighting
                   F     boat sighting
                   R     resume effort
                   E     end effort
                   V     sea state viewing conditions
                   N     navigation information
                   W     weather information
                   C     comment
                   P     observer positions
                   Q     tracking team positions
                   A     auxiliary sighting information
                   s     sighting position update
                   *     automatic position record (every 10 min.)
                   #   a deleted event
           1,2,3,4,5,or 6     school size and species proportions
5          period . to indicate on-effort event, otherwise blank
6-11       time (HHMMSS)
12         blank
13-18      date (MMDDYY)
19         blank
20-39      position, latitude and longitude
40         blank
41-44      data field 1         T
45         blank                *
46-49      data field 2         *
50         blank                *
51-54      data field 3         *   contents of data fields 1-7
55         blank                *   depends on type of event (see
56-59      data field 4         *   column 4)
60         blank                *
61-64      data field 5         *
65         blank                *
66-69      data field 6         *
70         blank                *
71-74      data field 7         *
75         blank                *
76-79      data field 8         *
80         blank                *
81-84      data field 9         *
```

Event	1	2	3	4	5	6	7	8	9
B	Cruise#	Passing	GMT Off.	EQ50 On?					
t	ObsID	Spp	Bearing	DistNMI	#turtles	AssocJFR	Reticle	Size	Caught?
F	ObsID	Bearing	DistNMI	Reticle					
R									
E									
V	Beauf	SwHght	SwDir	W.Temp.	**WindSpeed**				
N	Course	Speed							
W	Rain/Fog	HorzSun	VertSun	WindDir	Visibility				
P	1LtObsID	2LtObsID	1RtObsID	2RtObsID	Middle25x				
Q	LtObsID	RtObsID	RecObsID						
s	Sight#	Bearing	Reticle	DistNMI	Course				
*									
S,M,m	Sight#	ObsID	Cue	SCode	Bearing	Reticle	DistNMI	**Course Speed**	
A	Sight#	W.Temp	PhotoY/N	BirdsY/N	Spp1Code	Spp2Code	Spp3Code	**Possible**#	
1,2,3,4, 5, or 6	ObsID	BestSS	HighSS	LowSS	%Spp1	%Spp2	%Spp3		
C	Comments are continuous lines across all the data fields and may								
C	wrap around to subsequent comment lines.								

*Bold items are new entries for Vaquita Cruise.